

CLAIM AMENDMENTS

1. (Original) A heat-sensitive lithographic printing plate precursor comprising a support having a hydrophilic surface and a coating provided on the hydrophilic surface, said coating comprising in the order given a first layer containing an oleophilic resin soluble in an aqueous alkaline developer and a second layer capable of preventing penetration of the developer at unexposed areas, said second layer comprising a water-repellent compound selected from the group consisting of

- a polymer comprising siloxane and/or perfluoroalkyl monomeric units, and
- a block- or graft-copolymer comprising a poly- or oligo(alkylene oxide) and a polymer or oligomer comprising siloxane and/ or perfluoroalkyl monomeric units, and

wherein the alkali-solubility of said coating increases on heating and said coating comprises an infrared light absorbing dye characterised in that the infrared absorbing dye comprises at least one polysiloxane group.

2. (Original) A lithographic printing plate precursor according to claim 1 wherein the polysiloxane group is covalently linked to the infrared light absorbing dye.

3. (Original) A lithographic printing plate precursor according to claim 1 wherein the infrared light absorbing dye carries a charge and the polysiloxane group is comprised in a counter ion.

4. (Original) A lithographic printing plate precursor according to claim 1 wherein at least one polysiloxane group is covalently linked to the infrared light absorbing dye and at least one polysiloxane is comprised in a counter ion.

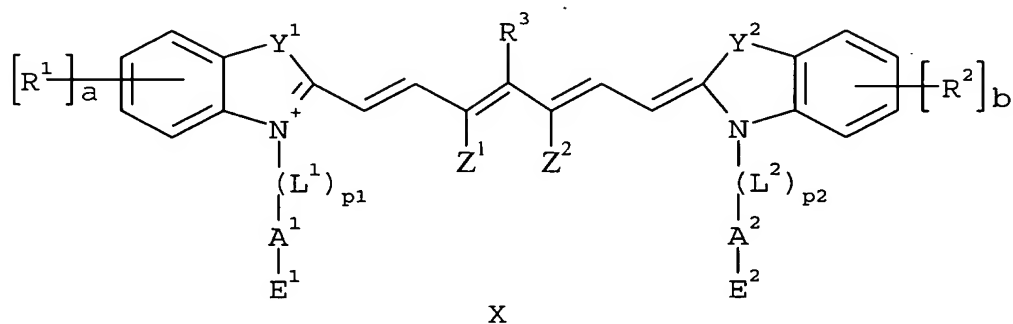
5. (Currently Amended) A lithographic printing plate precursor according to ~~any of the preceding claims~~ claim 1 wherein the infrared light absorbing dye is selected from the

group consisting of squarylium, croconate, merocyanine, cyanine, indolizine, pyrilium and metal dithioline dyes.

6. (Currently Amended) A lithographic printing plate precursor according to ~~any of the preceding claims~~ claim 1 wherein the amount of the water-repellent compound in the coating is between 0.5 and 15 mg/m².

7. (Currently Amended) A lithographic printing plate precursor according to ~~any of the preceding claims~~ claim 1 wherein the second layer of the coating consists essentially of the water-repellent compound and the infrared light absorbing dye.

8. (Currently Amended) A lithographic printing plate precursor according to ~~any of the preceding claims 1-4, 6 or 7~~ claim 1 wherein the infrared light absorbing dye corresponds to the following formula:



wherein

a and b each independently represent an integer from 0 to 4;

-L¹- and -L²- independently represent a divalent linking group;

$-E^1$ and $-E^2$ independently represent a neutral, anionic or cationic terminal group selected from

alkyl, $-OH$, $-H$, $-Cl$, $-Br$, $-F$, $-SiR^aR^bR^c$ (neutral groups);

$-SO_3^-$, $-SO_4^-$, $-PO_3^{2-}$, $-PO_4^{2-}$, $-COO^-$ (anionic groups);

$-[NR^dR^eR^f]^+$ (cationic group);

R^a , R^b and R^c independently represent an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

R^d , R^e and R^f independently represent a hydrogen atom or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

$-A^1-$ and $-A^2-$ independently represent $-[Si(R^gR^h)-O]_m-$, $-C_vF_{2v}-$,

$-[(CF_2)_2-O]_w-$ or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

R^g and R^h independently represent an optionally substituted alkyl, alkenyl, aryl or aralkyl group, $-[O-Si(R^aR^b)]_q-E^1$ or

$-[O-Si(R^aR^b)]_q-E^2$;

with p_1 and p_2 is 0 or 1;

with t , q and m is 1 or an integer greater than 1;

with v and w is 2 or an integer greater than 2;

$-Y^1-$ and $-Y^2-$ independently represent one or two non-metallic atoms, which may be substituted, necessary to complete a 5- or 6-membered heterocyclic ring;

$-Z^1$ and $-Z^2$ each independently represent a hydrogen atom, an alkyl group or $-Z^1$ and $-Z^2$ together represent the necessary atoms to complete a 5- or 6-membered ring;

R^1 and R^2 each independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a group selected from a halogen atom, $-NO_2$, $-O-R^i$, $-CO-R^i$, $-CO-O-R^i$, $-O-CO-R^i$, $-CO-NR^iR^j$, $-NR^iR^j$, $-NR^i-CO-R^j$, $-NR^i-CO-O-R^j$, $-NR^i-CO-NR^jR^k$, $-SR^i$, $-SO-R^i$, $-SO_2-R^i$, $-SO_2-O-R^i$, $-SO_2NR^iR^j$, a perfluoroalkyl group or a polysiloxane group;

each of said groups optionally comprise a terminal group E defined above as $-E^1$ and $-E^2$ and/or wherein two adjacent groups selected from R^1 , R^2 , $-Y^1$ - and $-Y^2$ - together form an optionally substituted 5- or 6- membered ring;

R^i , R^j and R^k independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

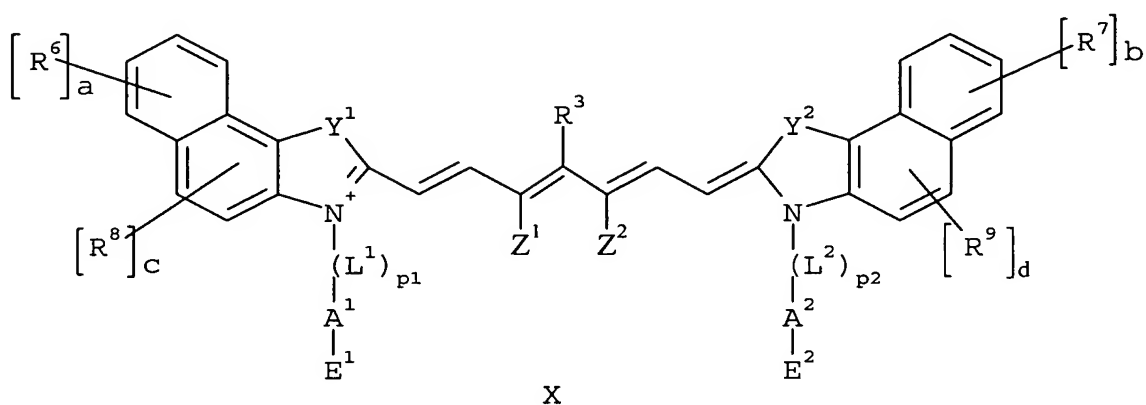
R^3 represents a substituent selected from a hydrogen, a halogen atom, an alkyl, alkenyl, aryl or aralkyl group, a perfluoroalkyl group, a polysiloxane group, an amino group, a thioalkyl group, a thioaryl group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;

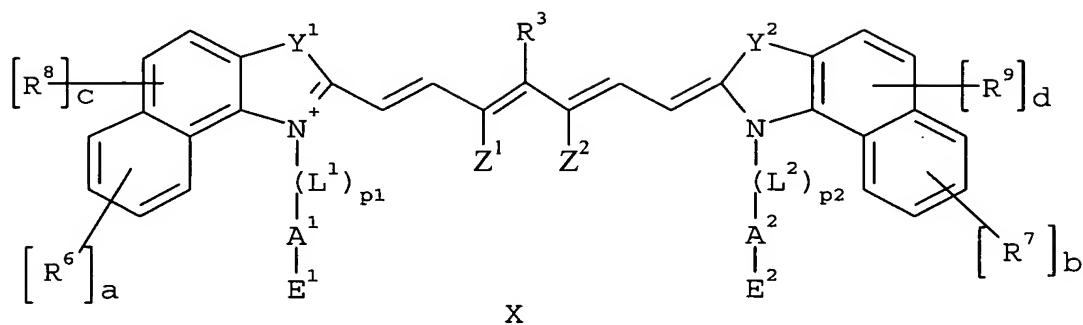
X represents one or more optional counter ions having a total charge opposite to the dye and wherein X optionally comprises a polysiloxane group;

with the proviso that at least one of the following substituents contains a polysiloxane group: R^1 , R^2 , R^3 , $-A^1$ -, $-A^2$ - or X.

9. (Original) A printing plate precursor according to claim 8 wherein $-Z^1$ and $-Z^2$ together represent $-(CH_2)_2$ - or $-(CH_2)_3$ -.

10. (Original) A lithographic printing plate precursor according to claim 8 wherein the IR light absorbing dye corresponds to the following formulae:





wherein p_1 , p_2 , a , b , $-L^1$ -, $-L^2$ -, $-E^1$ -, $-E^2$ -, $-A^1$ -, $-A^2$ -, $-Y^1$ -, $-Y^2$,

$-Z^1$ -, $-Z^2$ -, R^3 and X have the same meaning as defined in claim 8;

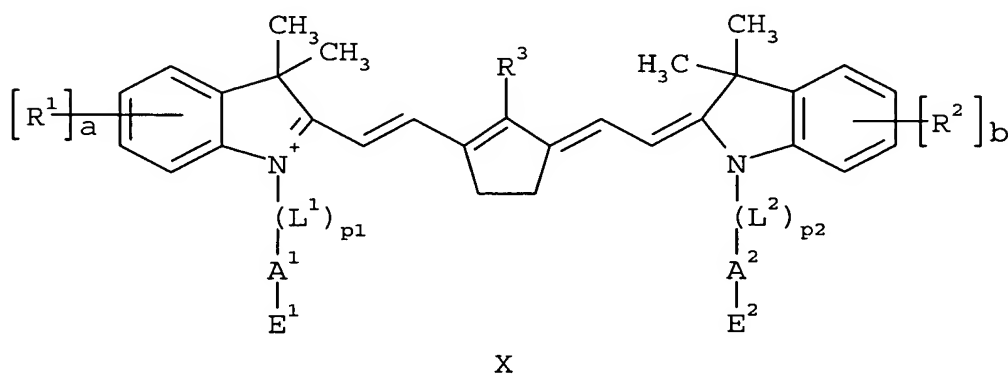
c and d are independently 0, 1 or 2;

each R^6 to R^9 independently represent a group as defined for R^1 and R^2 in claim 8,

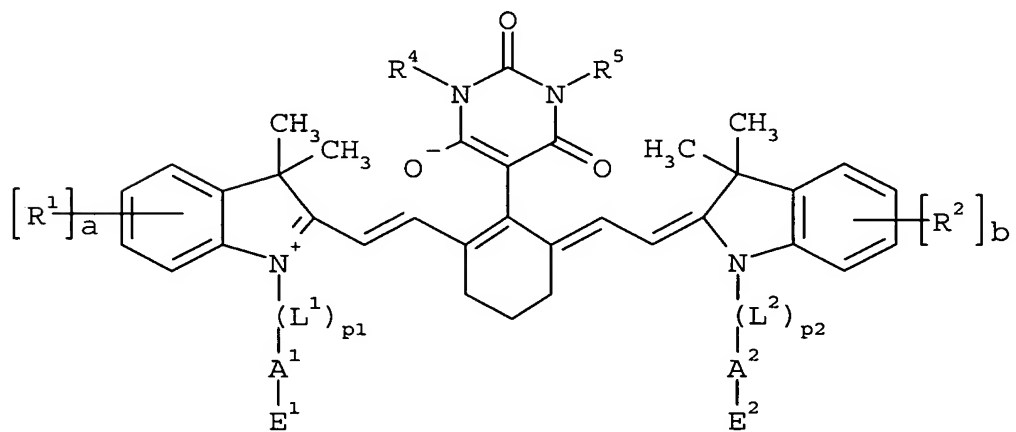
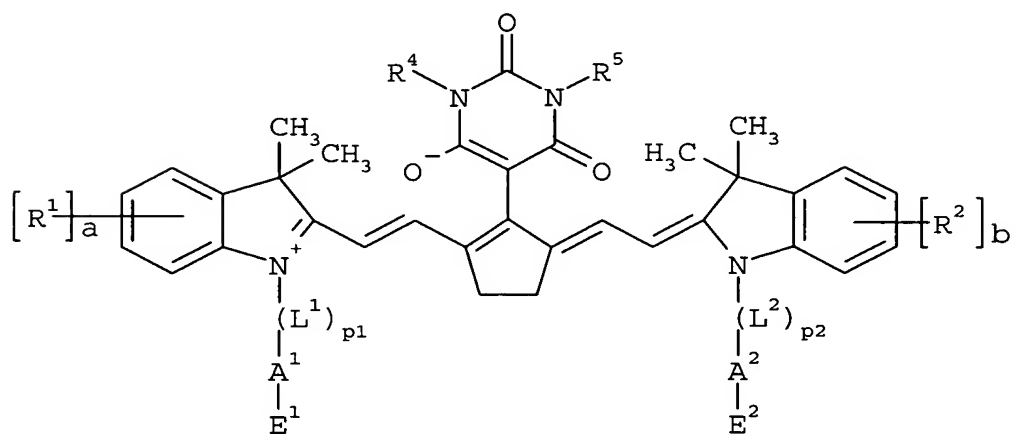
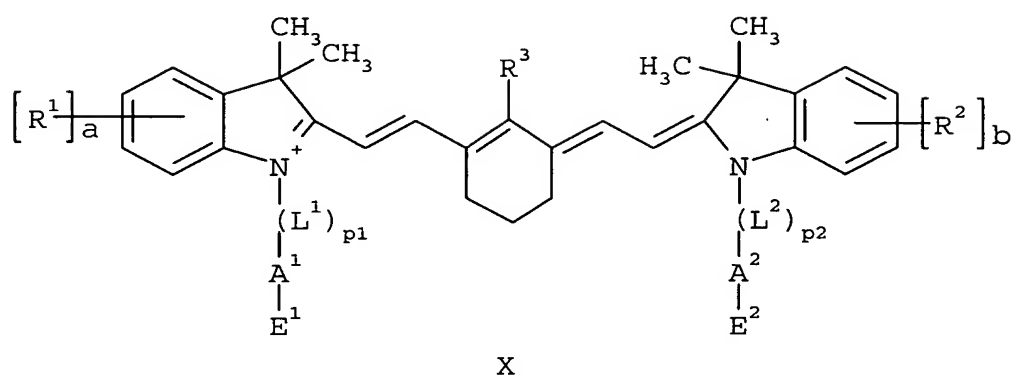
with the proviso that at least one of the following substituents contains a polysiloxane group:

R^3 , R^6 to R^9 , $-A^1$ -, $-A^2$ or X .

11. (Currently Amended) A lithographic printing plate precursor according to ~~any~~ ~~of the~~ claim 8 wherein the IR light absorbing dye corresponds to the following formulae:



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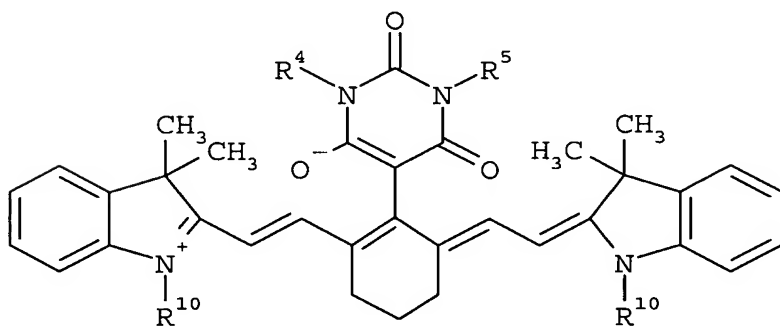
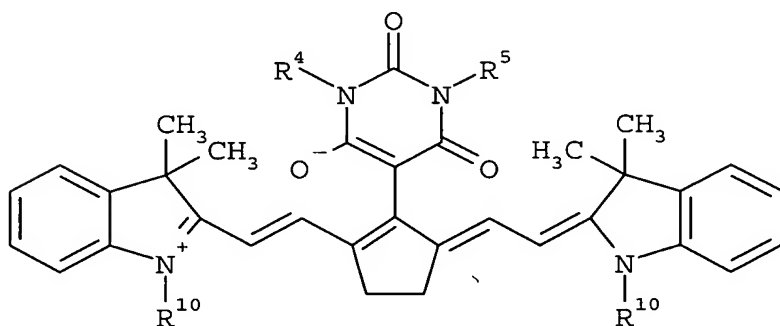
wherein

$p_1, p_2, a, b, -L^1-, -L^2-, -E^1, -E^2, -A^1-, -A^2, R^1, R^2,$

R^3 and X have the same meaning as defined in claim 8;

R^4 and R^5 independently represent an optionally substituted alkyl, alkenyl, cycloalkyl, aryl or aralkyl group, a perfluoroalkyl group or a polysiloxane group; each of said groups optionally comprise a terminal group E defined in claim 8 as $-E^1$ and $-E^2$; with the proviso that at least one of the following substituents contains a polysiloxane group: R^1 , R^2 , R^3 , R^4 , R^5 , $-A^1$, $-A^2$ or X.

12. (Original) A lithographic printing plate precursor according to claim 8 wherein the IR light absorbing dye corresponds to the following formulae:



wherein

R^4 and R^5 independently represent an optionally substituted alkyl, alkenyl, cycloalkyl, aryl or aralkyl group, a perfluoroalkyl group or a polysiloxane group; each of said groups optionally comprise a terminal group E defined in claim 8 as $-E^1$ and $-E^2$;

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R^{10} represents $-(CH_2)_e-Si-[OSi(R^{11}R^{12}R^{13})]_3$ or
 $-(CH_2)_e-OCO-(CH_2)_f-[Si(R^{14}R^{15})-O]_g-(CH_2)_h-CH_3$;

R^{11} , R^{12} , R^{13} , R^{14} and R^{15} independently represent an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

e, f, g and h is 1 or an integer greater than 1.

13. (Currently Amended) A lithographic printing plate precursor according to ~~any~~ of the preceding claims claim 1 wherein the polysiloxane group has a linear or branched structure.

14. (New) A lithographic printing plate precursor according to claim 2 wherein the infrared light absorbing dye is selected from the group consisting of squarylium, croconate, merocyanine, cyanine, indolizine, pyrilium and metal dithioline dyes.

15. (New) A lithographic printing plate precursor according to claim 3 wherein the infrared light absorbing dye is selected from the group consisting of squarylium, croconate, merocyanine, cyanine, indolizine, pyrilium and metal dithioline dyes.

16. (New) A lithographic printing plate precursor according to claim 4 wherein the infrared light absorbing dye is selected from the group consisting of squarylium, croconate, merocyanine, cyanine, indolizine, pyrilium and metal dithioline dyes.

17. (New) A lithographic printing plate precursor according to claim 2 wherein the amount of the water-repellent compound in the coating is between 0.5 and 15 mg/m².

18. (New) A lithographic printing plate precursor according to claim 3 wherein the amount of the water-repellent compound in the coating is between 0.5 and 15 mg/m².

19. (New) A lithographic printing plate precursor according to claim 4 wherein the amount of the water-repellent compound in the coating is between 0.5 and 15 mg/m².

20. (New) A lithographic printing plate precursor according to claim 5 wherein the amount of the water-repellent compound in the coating is between 0.5 and 15 mg/m².

21. (New) A lithographic printing plate precursor according to claim 2 wherein the second layer of the coating consists essentially of the water-repellent compound and the infrared light absorbing dye.

22. (New) A lithographic printing plate precursor according to claim 3 wherein the second layer of the coating consists essentially of the water-repellent compound and the infrared light absorbing dye.

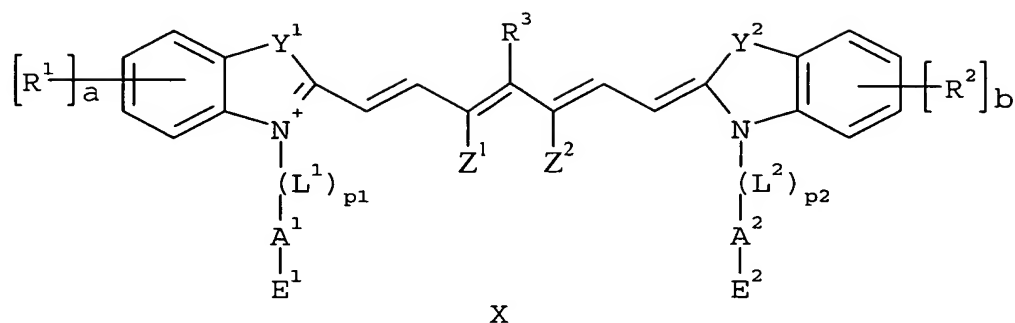
23. (New) A lithographic printing plate precursor according to claim 4 wherein the second layer of the coating consists essentially of the water-repellent compound and the infrared light absorbing dye.

24. (New) A lithographic printing plate precursor according to claim 5 wherein the second layer of the coating consists essentially of the water-repellent compound and the infrared light absorbing dye.

25. (New) A lithographic printing plate precursor according to claim 6 wherein the second layer of the coating consists essentially of the water-repellent compound and the infrared light absorbing dye.

26. (New) A lithographic printing plate precursor according to claim 4 wherein the infrared light absorbing dye corresponds to the following formula:

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wherein

a and b each independently represent an integer from 0 to 4;

-L¹- and -L²- independently represent a divalent linking group;

-E¹ and -E² independently represent a neutral, anionic or cationic terminal group selected from

alkyl, -OH, -H, -Cl, -Br, -F, -SiR^aR^bR^c (neutral groups);

-SO₃⁻, -SO₄⁻, -PO₃²⁻, -PO₄²⁻, -COO⁻ (anionic groups);

-[NR^dR^eR^f]⁺ (cationic group);

R^a, R^b and R^c independently represent an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

R^d, R^e and R^f independently represent a hydrogen atom or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

-A¹- and -A²- independently represent -[Si(R^gR^h)-O]_m-, -C_vF_{2v}-,

-[(CF₂)₂-O]_w- or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

R^g and R^h independently represent an optionally substituted alkyl, alkenyl, aryl or aralkyl group, -[O-Si(R^aR^b)]_q-E¹ or

-[O-Si(R^aR^b)]_q-E²;

with p_1 and p_2 is 0 or 1;

with t , q and m is 1 or an integer greater than 1;

with v and w is 2 or an integer greater than 2;

$-Y^1-$ and $-Y^2-$ independently represent one or two non-metallic atoms, which may be substituted, necessary to complete a 5- or 6-membered heterocyclic ring;

$-Z^1$ and $-Z^2$ each independently represent a hydrogen atom, an alkyl group or $-Z^1$ and $-Z^2$ together represent the necessary atoms to complete a 5- or 6-membered ring;

R^1 and R^2 each independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a group selected from a halogen atom, $-\text{NO}_2$, $-\text{O}-R^i$, $-\text{CO}-R^i$, $-\text{CO}-\text{O}-R^i$, $-\text{O}-\text{CO}-R^i$, $-\text{CO}-\text{NR}^i\text{R}^j$, $-\text{NR}^i\text{R}^j$, $-\text{NR}^i-\text{CO}-R^j$, $-\text{NR}^i-\text{CO}-\text{O}-R^j$, $-\text{NR}^i-\text{CO}-\text{NR}^j\text{R}^k$, $-\text{SR}^i$, $-\text{SO}-R^i$, $-\text{SO}_2-R^i$, $-\text{SO}_2-\text{O}-R^i$, $-\text{SO}_2\text{NR}^i\text{R}^j$, a perfluoroalkyl group or a polysiloxane group; each of said groups optionally comprise a terminal group E defined above as $-E^1$ and $-E^2$ and/or wherein two adjacent groups selected from R^1 , R^2 , $-Y^1-$ and $-Y^2-$ together form an optionally substituted 5- or 6- membered ring;

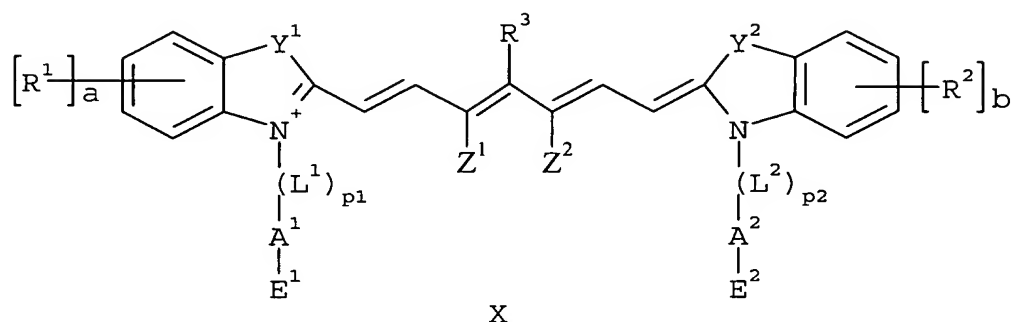
R^i , R^j and R^k independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

R^3 represents a substituent selected from a hydrogen, a halogen atom, an alkyl, alkenyl, aryl or aralkyl group, a perfluoroalkyl group, a polysiloxane group, an amino group, a thioalkyl group, a thioaryl group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;

X represents one or more optional counter ions having a total charge opposite to the dye and wherein X optionally comprises a polysiloxane group;

with the proviso that at least one of the following substituents contains a polysiloxane group: R^1 , R^2 , R^3 , $-A^1-$, $-A^2-$ or X.

27. (New) A lithographic printing plate precursor according to claim 6 wherein the infrared light absorbing dye corresponds to the following formula:



wherein

a and b each independently represent an integer from 0 to 4;

-L¹- and -L²- independently represent a divalent linking group;

-E¹ and -E² independently represent a neutral, anionic or cationic terminal group selected from

alkyl, -OH, -H, -Cl, -Br, -F, -SiRᵃRᵇRᶜ (neutral groups);

-SO₃⁻, -SO₄⁻, -PO₃²⁻, -PO₄²⁻, -COO⁻ (anionic groups);

-[NRᵈRᵉRᶠ]⁺ (cationic group);

Rᵃ, Rᵇ and Rᶜ independently represent an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

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R^d , R^e and R^f independently represent a hydrogen atom or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

$-A^1$ - and $-A^2$ - independently represent $-\text{[Si}(R^gR^h)\text{-O}]_m-$, $-\text{C}_v\text{F}_{2v}-$, $-\text{[(CF}_2)_2\text{-O}]_w-$ or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

R^g and R^h independently represent an optionally substituted alkyl, alkenyl, aryl or aralkyl group, $-\text{[O-Si}(R^aR^b)]_q\text{-E}^1$ or $-\text{[O-Si}(R^aR^b)]_q\text{-E}^2$;

with p_1 and p_2 is 0 or 1;

with t , q and m is 1 or an integer greater than 1;

with v and w is 2 or an integer greater than 2;

$-Y^1$ - and $-Y^2$ - independently represent one or two non-metallic atoms, which may be substituted, necessary to complete a 5- or 6-membered heterocyclic ring;

$-Z^1$ and $-Z^2$ each independently represent a hydrogen atom, an alkyl group or $-Z^1$ and $-Z^2$ together represent the necessary atoms to complete a 5- or 6-membered ring;

R^1 and R^2 each independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a group selected from a halogen atom, $-\text{NO}_2$, $-\text{O-R}^i$, $-\text{CO-R}^i$, $-\text{CO-O-R}^i$, $-\text{O-CO-R}^i$, $-\text{CO-NR}^i\text{R}^j$, $-\text{NR}^i\text{R}^j$, $-\text{NR}^i\text{-CO-R}^j$, $-\text{NR}^i\text{-CO-O-R}^j$, $-\text{NR}^i\text{-CO-NR}^j\text{R}^k$, $-\text{SR}^i$, $-\text{SO-R}^i$, $-\text{SO}_2\text{-R}^i$, $-\text{SO}_2\text{-O-R}^i$, $-\text{SO}_2\text{NR}^i\text{R}^j$, a perfluoroalkyl group or a polysiloxane group; each of said groups optionally comprise a terminal group E defined above as $-\text{E}^1$ and $-\text{E}^2$ and/or wherein two adjacent groups selected from R^1 , R^2 , $-Y^1$ - and $-Y^2$ - together form an optionally substituted 5- or 6- membered ring;

R^i , R^j and R^k independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

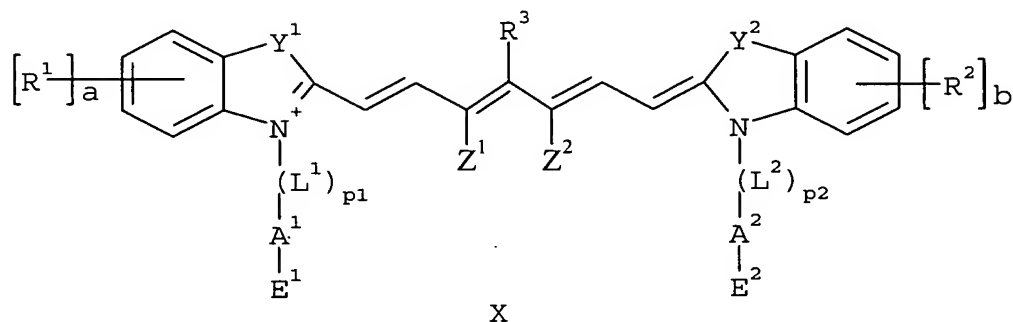
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R^3 represents a substituent selected from a hydrogen, a halogen atom, an alkyl, alkenyl, aryl or aralkyl group, a perfluoroalkyl group, a polysiloxane group, an amino group, a thioalkyl group, a thioaryl group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;

X represents one or more optional counter ions having a total charge opposite to the dye and wherein X optionally comprises a polysiloxane group;

with the provisio that at least one of the following substituents contains a polysiloxane group:
 R^1 , R^2 , R^3 , $-A^1-$, $-A^2-$ or X.

28. (New) A lithographic printing plate precursor according to claim 7 wherein the infrared light absorbing dye corresponds to the following formula:



wherein

a and b each independently represent an integer from 0 to 4;

$-L^1-$ and $-L^2-$ independently represent a divalent linking group;

$-E^1$ and $-E^2$ independently represent a neutral, anionic or cationic terminal group selected from

alkyl, $-OH$, $-H$, $-Cl$, $-Br$, $-F$, $-SiR^aR^bR^c$ (neutral groups);

$-SO_3^-$, $-SO_4^-$, $-PO_3^{2-}$, $-PO_4^{2-}$, $-COO^-$ (anionic groups);

$-[NR^dR^eR^f]^+$ (cationic group);

R^a , R^b and R^c independently represent an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

R^d , R^e and R^f independently represent a hydrogen atom or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

$-A^1-$ and $-A^2-$ independently represent $-[Si(R^gR^h)-O]_m-$, $-C_vF_{2v}-$,

$-[(CF_2)_2-O]_w-$ or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

R^g and R^h independently represent an optionally substituted alkyl, alkenyl, aryl or aralkyl group, $-[O-Si(R^aR^b)]_q-E^1$ or

$-[O-Si(R^aR^b)]_q-E^2$;

with p_1 and p_2 is 0 or 1;

with t , q and m is 1 or an integer greater than 1;

with v and w is 2 or an integer greater than 2;

$-Y^1-$ and $-Y^2-$ independently represent one or two non-metallic atoms, which may be substituted, necessary to complete a 5- or 6-membered heterocyclic ring;

$-Z^1$ and $-Z^2$ each independently represent a hydrogen atom, an alkyl group or $-Z^1$ and $-Z^2$ together represent the necessary atoms to complete a 5- or 6-membered ring;

R^1 and R^2 each independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a group selected from a halogen atom, $-NO_2$, $-O-R^i$, $-CO-R^i$, $-CO-O-R^i$, $-O-CO-R^i$, $-CO-NR^iR^j$, $-NR^iR^j$, $-NR^i-CO-R^j$, $-NR^i-CO-O-R^j$, $-NR^i-CO-NR^jR^k$, $-SR^i$, $-SO-R^i$, $-SO_2-R^i$, $-SO_2-O-R^i$, $-SO_2NR^iR^j$, a perfluoroalkyl group or a polysiloxane group;

each of said groups optionally comprise a terminal group E defined above as $-E^1$ and $-E^2$ and/or wherein two adjacent groups selected from R^1 , R^2 , $-Y^1$ - and $-Y^2$ - together form an optionally substituted 5- or 6- membered ring;

R^i , R^j and R^k independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

R^3 represents a substituent selected from a hydrogen, a halogen atom, an alkyl, alkenyl, aryl or aralkyl group, a perfluoroalkyl group, a polysiloxane group, an amino group, a thioalkyl group, a thioaryl group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;

X represents one or more optional counter ions having a total charge opposite to the dye and wherein X optionally comprises a polysiloxane group;

with the proviso that at least one of the following substituents contains a polysiloxane group: R^1 , R^2 , R^3 , $-A^1$ -, $-A^2$ - or X.

29. (New) A lithographic printing plate precursor according to claim 2 wherein the polysiloxane group has a linear or branched structure:

30. (New) A lithographic printing plate precursor according to claim 3 wherein the polysiloxane group has a linear or branched structure.

31. (New) A lithographic printing plate precursor according to claim 4 wherein the polysiloxane group has a linear or branched structure.

32. (New) A lithographic printing plate precursor according to claim 5 wherein the polysiloxane group has a linear or branched structure.

33. (New) A lithographic printing plate precursor according to claim 6 wherein the polysiloxane group has a linear or branched structure.

34. (New) A lithographic printing plate precursor according to claim 7 wherein the polysiloxane group has a linear or branched structure.

35. (New) A lithographic printing plate precursor according to claim 8 wherein the polysiloxane group has a linear or branched structure.

36. (New) A lithographic printing plate precursor according to claim 9 wherein the polysiloxane group has a linear or branched structure.

37. (New) A lithographic printing plate precursor according to claim 10 wherein the polysiloxane group has a linear or branched structure.

38. (New) A lithographic printing plate precursor according to claim 11 wherein the polysiloxane group has a linear or branched structure.

39. (New) A lithographic printing plate precursor according to claim 12 wherein the polysiloxane group has a linear or branched structure.